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FR/EE
WR MD
MAILSTOP 66135

JAN 27 1986

MEMORANDUM

To: ARD-Wildlife Resources, Region 6
MAILSTOP 66135
Attn: Henry

From: Regional Hydrologist, Engineering, Region 6

Subject: Annual Water Management Plans, North Dakota

Reports have been reviewed and found to be in order for the following stations:

Arrowwood NWR
Long Lake NWR *
Tewaukon NWR ✓
Devils Lake WMD
Billings Lake NWR
Brumba NWR
Hofstrand Lake WPA **
Kelly Slough NWR
Lake Alice NWR *
Lake Ardoch NWR
Lamb's Lake NWR
Little Goose NWR
Pleasant Lake NWR
Rock Lake NWR
Rose Lake NWR
Silver Lake NWR
Snyder Lake NWR
Wood Lake Marsh NWR

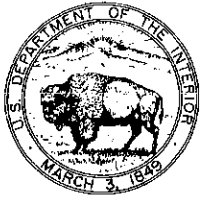
* A Water Management Plan was submitted for Long Lake NWR that will be copied and used for the State required Operation Plan and the State required Operation Plan that was submitted for Lake Alice will be copied and suffice as a Water Management Plan.

** Since the Short Form Water Management Plan does not give sufficient information, an Operation Plan is still required for the Hofstrand Lake WPA.

Please extend our thanks to station personnel for the timely submission and detailed reports.

EN:GCHESY:JLR: 1/24/86 bcc: ENG RDG: FL CIRC FL RD

Robert C. Green



United States Department of the Interior

FISH AND WILDLIFE SERVICE
TEWAUKON NATIONAL WILDLIFE REFUGE
RR #1, BOX 75
CAYUGA, NORTH DAKOTA 58013

Rec'd
Wildlife Res. DEC 16 1985



MEMORANDUM

December 12, 1985

JDH/h

To: WR, ND Refuge Supervisor (60130)
Denver, CO

From: Refuge Manager, Tewaukon NWR (62660)
Cayuga, ND

Subject: 1986 Annual Water Management Plan and 1985 Use Report

1. List of Water Rights

Tewaukon NWR #1261: 7,139 acre-feet yearly (4,852 storage and 2,287 seasonal use) for Lake Tewaukon (Pool 1) and Pools 2, 3, 4, 11 and 12 dated December 1964, diversion by dams across the Wild Rice River.

Declaration of Filing (#57) dated September 1, 1934 claimed 397 acre-feet storage and 312 acre-feet seasonal use for Clouds Lake (Pool 8) now called Hapi Lake. Listed on the same sheet as Lake Tewaukon/White Lake, as per RO(EN) Marshall Fox's 11-14-83 memo.

Tewaukon NWR #1262: 1,130 acre-feet yearly (635 acre-feet storage and 495 acre-feet seasonal use) for Sprague Lake, dated December 1964, diversion from an unnamed creek in the SE $\frac{1}{4}$ NW $\frac{1}{4}$, Section 2.

Tewaukon NWR #1263: 686 acre-feet yearly for Mann Lake (236 acre-feet) and Horseshoe Slough (450 acre-feet) dated December 1964, diversion from the Wild Rice River.

2. Actual Water Use - 1985

All four watersheds (Wild Rice River, Frenier Dam Outlet, Sprague Lake ditch, LaBelle Creek) flowed below average this spring but enough to bring all wetlands up to management level. The Wild Rice River began flowing into the Refuge March 14, 1985. The one surprising exception was that the Wild Rice River continued a low but steady flow 4-6 weeks later into spring than was expected based on the lack of snow pack or significant rains. It is believed that 1984 work by the Sargent County Water Management Board in cleaning an old legal drain west of Cogswell caused this increased flow in the Wild Rice River. This greatly increased flowage period probably will become a routine occurrence, especially since the clean-out work continued in 1985.

Natural wetlands received virtually no inflows and started spring at dry to low water levels. Even deep Type IV wetlands were dry by late summer.

Lake Tewaukon (Pool 1): The Lake was frozen at 1147.5 MSL until March 27. Inflows were received, as usual, from LaBelle Creek and the Wild Rice River with a maximum depth of 10.1 feet (1148.6 MSL) reached April 8, 1985. This was .6 feet greater than full management depth (1148.0 MSL) in an attempt to push water east to fill the Refuge's three Krause wetlands. (However the Lake raised high enough to supply only one inch of water which made only a minor improvement in the first pond.)

Starting April 8, boards were removed from Dam 1 to slowly lower the Lake. Operating level (1147.9 MSL) was reached June 27 and no further water releases were made. Small amounts of water were released from Dam 2 into Lake Tewaukon during July and August in an effort to attract carp into nets. This plus a cooler and wetter than normal late summer and fall put the Lake into freeze-up quite high for the second year in a row. Lake Tewaukon froze over completely on November 12 (except for two holes kept open by waterfowl) at 1147.26 MSL.

Parker Bay (east end of Lake Tewaukon): This 95 acre marsh provided excellent waterfowl habitat. On July 2-3 six inches of water (all that was available) were flowed in from West Parker Bay, drawing it down two feet which was beneficial to waterfowl. Maximum depth for Parker Bay was between 2½-3½ feet this year.

Cutler Marsh (Pool 2): This Pool began the spring very low due to last fall's draw-down. On April 3 and April 19 single (4" wide) boards were added to hold water back so carp could not invade from Pool 1. Between March 25 and April 9 water was flowed from this Pool into East White Lake for duck production. In June, July and half of August a small flow was released from Dam 2 in an (unsuccessful) effort to attract spawning carp into nets. This Pool was kept low in anticipation of a dike construction project which did not materialize. It was well below the gauge all year including freeze-up.

Pool 2A: From mid-March to April 2 water was flowed into this 30 acre marsh and it was topped off. Very good waterfowl habitat resulted from the deeply flooded cattails and water backed into a wetland to the southwest. As usual, however, the Pool depth decreased rapidly and by August cattail were severely filling in all open areas. In November the Dike was raised two feet and rip-rapped so another six inches of water can be stored in spring 1986 for use through the summer by waterfowl.

Pool 3 (Maka Pool): To better flood the higher west end, this Pool was flooded very deeply to a maximum of 1156.75 on April 2, 1985. This was too high as excessive nesting island erosion occurred and the Township roadgrade started to soften. Boards were pulled and the Pool dropped to about 1155.4 by the end of June. In early August about one foot of water was dumped in anticipation of a Ducks Unlimited project which didn't materialize.

Pool 3A: Held good water all year as usual. In late summer suspicions were confirmed that the structure was leaking water into Pool 3. It seemed the bottom board (under water) was hung up in the channel and water was passing freely beneath it. We'll see next spring if the problem's been solved.

Pool 4 (River Pool): The Pool was filled to a maximum of 1160.48 on April 26. That day one board (4") was pulled to accomodate the upstream neighbor. In order to flood out cattails in 1986, mowing was planned for fall of 1985 and dewatering began September 3, 1985 with the Pool at 1157.85 MSL. On September 6, 1985 the Pool was below the gauge and even with the lower pool. (Early, heavy snows cancelled the mowing plans.)

Pools 5,5A,6,7,7A: No inflows were received. Pool 7A was dry and the others began the spring very low. All were dry by about mid-August.

Pool 8 (Hepi Lake): In continuation of the goal to establish cattail-bulrush vegetation in this open 108 acre lake, it was pulled down about one foot via the tile line into Pool 4. Cattail-bulrush response was excellent and a fine stand grew in. It froze this fall at an estimated maximum of 12-18 inches.

Pool 10: This small slough was dry all year.

Pool 11 (West White Lake): Received no inflows and dried up rapidly. Only the deeper east end provided habitat. It was 100% dry by about September 1, 1985.

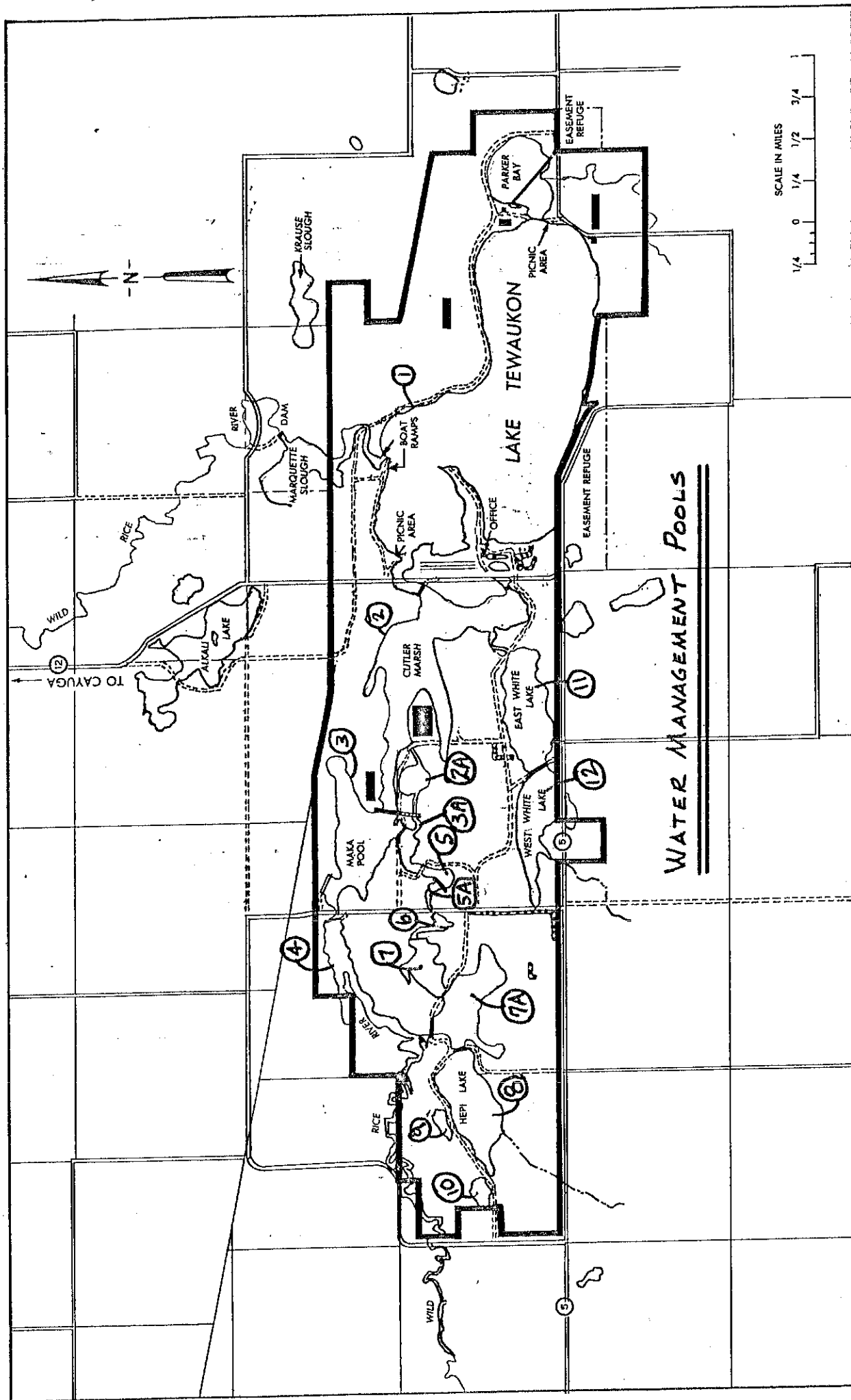
Pool 12 (East White Lake): This pool dropped rapidly and water was added from Pool 2 from March 25-April 9 to an estimated maximum of four feet deep. Cattails rapidly encroached on most open areas due to low water, especially from mid-summer on. The Pool froze at a maximum of about 2.7 feet deep. (It was 2.8 feet deep September 13, 1985.)

Pool 13 (Mann Lake): This Pool was kept closed off to cause it to dry out to promote cattail-bulrush growth. In spring it was about two feet deep maximum and was dry by about October 1, 1985.

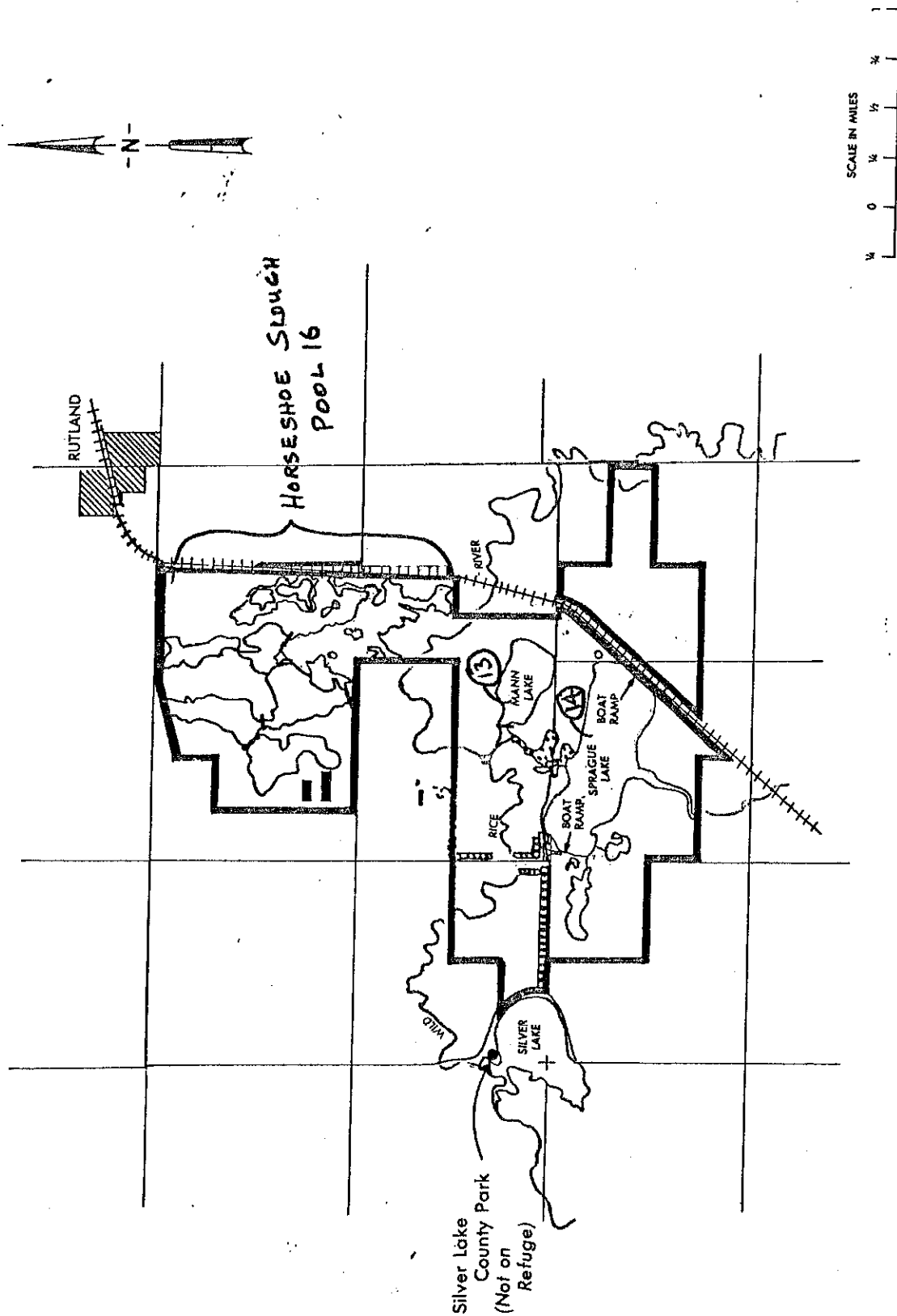
Pool 14 (Sprague Lake): The Lake was frozen at 2.8 on the informal gauge (8.56 feet deep). Average inflows occurred and it was over-full at 4.69 (10.45 feet) on March 25, 1985. It was dewatered to full pool (2.8) by June 17. In October, three boards (16 inches) were removed to lower the lake to a better fall pool level. It froze at about seven feet deep which is deeper than what has been average in the past.

Pool 16 (Horseshoe Slough Group): Last summer's improvement in the Dam A inlet channel from the Wild Rice River and a second inlet structure allowed some water to gravity flow into this complex of seven large wetlands, about 244 acres total. In order to finally fill this complex (which was constructed in 1979 and never has been over 20% full) a 16 inch Crisafulli pump was used from March 15 - April 2 with many days of 24 hours pumping. All pools were deeply flooded except Pools C-East and C-South which needed additional corrective work on their inlet structures. Waterfowl response was excellent.

TEWAUKON NWR



SPRAGUE LAKE UNIT



TEWAUKON NATIONAL WILDLIFE REFUGE
Pools, Elevations and Acres

<u>POOL</u>	<u>ELEVATION</u>	<u>ACRES</u>
Pool 1 - Tewaukon	1149	1015
Parker's Bay	1149	95
Pool 2 - Cutler's Marsh	1152	246
Pool 2A		30
Pool 3 - Maka Pool	1156	125
Pool 3A		18
Pool 4 - River Pool	1159	108
Pool 5	1160	6
Pool 5A		5
Pool 6	1165	6
Pool 7	1178	21
Pool 7A		106
Pool 8 - Hepi Lake	1179	106
Pool 9	1167	10
Pool 10	1173	5.5
Pool 11 - W. White Lake	1151	80
Pool 12 - E. White Lake	1147	103
Pool 13 - Mann Lake	1207	57
Pool 14 - Sprague Lake	1209	186
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Pool 16 - Horseshoe Slough		244
Pool 1	1210	119.7
Pool 2	1206	42.5
Pool 3	1206	10.3
Pool 4	1206	30.3+
Pool 5	1206	24.5
Pool 6	1206	2.8+
Pool 7	1206	14.5

3. Impoundment Data

Please see the attached chart for capacities for each pool at various elevations. No formal inflow/outflow records were maintained. Please see Section #2 above for elevation changes for the various pools.

4. Descriptive Narrative - 1986 Plans

If 1986 is a dry year, the plan will be simple: hold all the water we have for maximum waterfowl production from each pool. However, if adequate runoff occurs, the following management objectives will be attempted:

Pool 1 (Lake Tewaukon): Overfill to approximately 1149-1150.0 MSL for two to five days to flow water into adjacent, dry wetlands in the Krause WPA, Tewaukon (State) WMA and Refuge. Then drop the Lake back to the maximum management depth of 1148 MSL for sport fishery habitat.

Parker Bay (East end of Lake Tewaukon): Flood to a maximum of four feet deep as early as possible in the spring before significant duck nesting occurs. Add water in late spring or summer as needed to maintain a maximum 2½-3 feet deep for waterfowl production and maintenance.

Pool 2 (Cutler Marsh): Assuming no progress on the interior dike paperwork, fill the Pool to about 1150-1151 MSL to best flood the heavily vegetated west end without killing out the cattails and bulrush in the lower pool. Release small amounts of water from June-August when correct water temperatures occur to promote carp netting by local sportsmen.

Pool 3 (Maka Pool): Fill full (approximately 1156.2 MSL) and stabilize as quickly as possible before April 15 for over-water duck nesting. Supply water to Pools 2A, 3A and the Nickeson Marsh as needed. In August begin drawing the Pool down to about 1153.5 to allow a Ducks Unlimited project to be built. (This will be a water control structure to supply the Nickeson Marsh, a GDU Tract.)

If the water permit is approved by the State Water Board and no objections are raised, water will be drawn from Pool 3 via a temporary culvert with flapgate backhoed into the Nickeson Dike early this spring. Water would be flowed into the Nickeson Marsh until a maximum depth of about three feet is achieved. Then the inflow would be stopped by releasing the flapgate down against the inlet side of the culvert. Later this culvert would be removed and the DU constructed, formal control structure built.

Pool 4 (River Pool): Continue the fall of 1985 draw-down and keep this Pool as empty as possible by letting the spring inflows pass through. This Pool hasn't been drawn down in at least ten years and nutrient recycling is needed. Also, fall mow the rank cattail stands if possible to create increased edge.

If early spring conditions permit, a second approach will be attempted. Before spring inflows are received the cattails will be prescribed burned. Then the

December 12, 1985

Pool would be filled full (about 1162 MSL) as quickly as possible to drown out much of the rank cattail growth which had been burned off.

Pools 2A, 3A, 5, 5A, 6, 7, 7A: Fill to maximum depth, if possible in order to flood out cattails. The pools will dry out rapidly through an average summer due to evaporation.

Pool 8 (Hepi Lake): An initial 4-5 foot depth may be taken to supply downstream pools 7A, 7, 6, 5, 5A, 3A and 2A. As soon as possible draw the pool down to $3\frac{1}{2}$ feet deep maximum to give the new cattail-bulrush stands a good second growing year.

Pool 9: Maintain this Pool closed off to cause it to draw-down naturally toward an eventual maximum depth of three feet. The need is to allow cattails to re-invade. (They were flooded out in 1983 when this Pool was used as a means to de-water Pool 8.)

Pool 10: Allow this Pool to fill naturally or open the supply ditch control and flood to a maximum depth of $2\frac{1}{2}$ feet. This wetland should be maintained as a three-square marsh; over-filling probably would flood them out and cattails would take over. It should be allowed to go dry by late August or September to maintain its highest use as a semi-permanent wetland.

Pool 11 (West White Lake): Allow natural run-off to fill this pool if possible. The cattail choked west end needs 4- $4\frac{1}{2}$ maximum depth. If necessary, pump water from East White Lake to achieve the needed flooding.

Pool 12 (East White Lake): Flood from Pool 2 to a maximum depth of 5-6 feet, if possible, to stress the rapidly invading cattails and to allow pumping into West White Lake. Stabilize water depth as quickly as possible for over-water nesting.

Pool 13 (Mann Lake): Continue closed off to cause it to dry out early this year, hopefully, to encourage establishment of cattail-bulrush cover.

Pool 14 (Sprague Lake): Fill to maximum pool (about eight feet deep) for fishery use.

Pool 16 (Horseshoe Slough): Gravity flow water from the Wild Rice River to fill all pools, especially Pool C-South - which never has had water. Some pumping may be necessary to top these pools off. Pool A should go to about 1207.5 MSL and all others to about 1206 MSL.

Hydrologic/Engineering Assistance

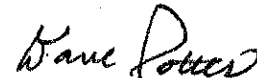
There are no known problems or projects requiring hydrologic/engineering assistance beyond the on-going Dam Safety Work and the Pool 2 Interior Cross Dike. Routine maintenance and repair will be done force account on parts of the water management system as necessary during 1986.

*Still in planning
stage W/AE [illegible]
Per Marshall 3/3/86
GK*

December 12, 1985

5. Location Map

Please see Section #2 for the revised Refuge map on which all management pools are marked.


David G. Potter

Attachment